Artificial intelligence and data science postgraduate conversion course funding

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Enquiries to PGconversion@officeforstudents.org.uk

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Introduction

1. At London Tech week in June 2019, the Government announced its intention to support conversion course programmes in artificial intelligence (AI) and data science technologies to help address the shortage of AI and data specialists in the UK.

2. In response, the Department for Culture, Media and Sport and the Office for Artificial Intelligence are providing funding to accelerate the number of skilled AI and data science graduates over the next three years.

3. The funding will be delivered by the Office for Students (OfS), through a competition that invites providers to develop and implement postgraduate conversion courses. These courses will, by autumn 2023, increase the number of skilled people in AI and data science by at least 2,500.

4. A total of £13 million will be made available to providers across the whole programme. The funding will be split across two strands:

    - £3 million will be allocated to course development costs, and

    - £10 million will be available as scholarships for students from underrepresented groups (as detailed in paragraph 19).

5. The funding will commence in April 2020 and we would expect to see students enrolling on first courses starting in autumn 2020.

Deadline for bids: **1700 on Friday 10 January 2020**

Data science and AI skills shortages

6. Effective digital skills training is essential to ensure the workforce is prepared for future technological changes. In 2016 the House of Commons Science and Technology Committee's report 'The Digital Skills Crisis'[1] estimated that the digital skills gap is costing the UK economy approximately £63 billion a year in lost additional GDP. The UK needs 745,000 additional workers with digital skills to meet rising demand from employers.

7. Employer demand for more skilled people in AI and data science is proven. Research from the job matching website 'Indeed' reveals the number of AI jobs in the UK listed on its online jobs board grew 485 per cent between 2014 and 2017[2]. According to analysis, this accounts for more than two jobs per qualified individual and six jobs for every qualified jobseeker.

[1] Available at: https://publications.parliament.uk/pa/cm201617/cmselect/cmsctech/270/27002.htm
[2] See https://www.recruitment-international.co.uk/blog/2017/10/number-of-ai-roles-in-britain-up-485-percent-since-2014-indeed-reveals

8. There is also demand for digitally-skilled employees in traditionally non-digital industries[3]. The Government's UK Digital Strategy[4] predicted that within 20 years, 90 per cent of all jobs will require some element of digital skills[5].

9. However, according to research from the Open University[6], the skills gap is costing UK businesses more than £2 billion a year in higher salaries, recruitment costs and temporary staffing. The same research also found that UK businesses spent £527 million on inflated salaries to attract talent, due to staff shortages. The extent to which demand is outstripping supply is particularly acute for AI and data technologies, where the supply of talent would need to increase by 70 per cent by 2020 to keep pace with demand.

10. In order to meet demand, the UK will need a larger workforce with deep AI expertise. The report Growing the Artificial Intelligence Industry in the UK[7] underlines that the experts needed to develop AI are in short supply. The report also emphasises that the current workforce is not representative of the wider population. In the past, lack of gender and ethnic diversity has been shown to affect the equitability of results from technology processes. If UK AI cannot improve the diversity of its workforce, the capability and credibility of the sector will be undermined.

11. The lack of diversity is further highlighted in the AI and Sector Deal Review[8], which acknowledges that increasing diversity in the AI workforce is vital to ensure that everyone with the potential to participate has the opportunity to do so. It is essential that AI developed in the UK reflects the needs and make-up of society as a whole. It is also crucial that industry and the public sector can access the greatest supply of talent in terms of numbers.

12. The Government's Industrial Strategy[9] identifies AI and data as one of its four Grand Challenges[10] to address in order to put the UK at the forefront of the AI and data revolution. That strategy also named the OfS as a key partner to address employer and student needs in the short, medium and long term. The OfS has been asked to consider the skills shortages that exist today and anticipate the demands of the future economy.

13. This competition aligns with the regulatory duties of the OfS as set out in the Higher Education and Research Act 2017: to promote equality of opportunity; to create more choice for students; and to ensure progression to further study or employment for all graduates. It helps to deliver

[3] See https://www.nesta.org.uk/report/tech-nation-2016/
[4] Department for Digital, Culture, Media & Sport (2017) 'UK Digital Strategy', Chapter 2: 'Digital skills and inclusion – giving everyone access to the digital skills they need'. Available at: https://www.gov.uk/government/publications/uk-digital-strategy/uk-digital-strategy
[5] Digital skills can be identified in three broad categories: 1) Basic digital skills: skills needed by every citizen to carry out basic functions; 2) Digital skills for the general workforce: minimum requirements linked to processing information that will be applicable across most sectors; 3) High level digital skills: the skills linked to the development and maintenance of new technologies, products and services. The Greater London Authority is currently participating in an exercise creating a nationally coherent framework defining digital skills.
[6] See https://www3.open.ac.uk/media/fullstory.aspx?id=31527#targetText=The%20skills%20gap%20is%20costing,research%20from%20The%20Open%20University.&targetText=At%20the%20same%20time%2C%20the,roles%20in%20the%20UK***
[7] See https://www.gov.uk/government/publications/growing-the-artificial-intelligence-industry-in-the-uk
[8] See https://www.gov.uk/government/publications/artificial-intelligence-sector-deal
[9] See https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future
[10] See https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/industrial-strategy-the-grand-challenges

on the Government's ambitions by encouraging innovation and stimulating a new, more diverse supply of highly skilled people to fill data science skills shortages in line with employer needs and in support of the wider economy.

Purpose of this competition

14. In response to the issues described above, the OfS will make £3 million available to providers to develop and implement new and innovative conversion courses that will deliver a step change in the available pipeline of AI and data science graduates. These courses will enable graduates from a wide range of disciplines to achieve a postgraduate degree and begin working in AI and data science occupations. The graduates will be not only from science, technology, engineering or mathematics (STEM) disciplines, but also from near-STEM, far-STEM and even non-STEM.

15. Because the OfS has a duty to ensure equality of opportunity for all graduates, this competition also aims to improve progression for underrepresented students into AI and data science professions. To achieve this, we will make available £10 million for scholarships to sit alongside the course development funding. Up to 1,000 eligible students will be supported by £10,000 scholarships. Scholarship funding is only intended for those underrepresented students listed in paragraph 19.

16. This competition builds on the recommendations from the evaluation of HEFCE's Engineering Postgraduate Conversion Course pilot. The report[11] found it is feasible for non-cognate graduates to attain an engineering or computing MSc degree through a conversion course. Furthermore, feedback from course leaders and those that have graduated to date indicates that they are seeking or have already secured roles in those sectors. The report recommended providers should seek out other opportunity areas for conversion, bearing in mind the needs of the economy for re-training and upskilling the existing workforce. It also recommended that providers seek to re-use some of the conversion course contents and approaches developed.

Competition scope and priorities

17. Development funding for individual proposals must not exceed £100,000. Development funding can include the costs associated with developing the curriculum and with those associated with outreach and recruitment activities.

18. Providers may submit collaborative proposals with other partners for development funding; the combined value of a collaborative bid should not exceed a maximum of £200,000. We will consider collaborative bids that exceed this limit if they aim to deliver at least half of the overall target number (i.e. 1,250 students). Bidders are encouraged to contact the OfS if they are considering a bid of that scale. The scale of funding must be proportionate to the number of partners in a collaboration.

19. There are 1,000 scholarships of £10,000 per students available to support the following underrepresented groups:

[11] Available at: www.officeforstudents.org.uk/publications/evaluation-of-a-scheme-to-develop-pilot-engineering-and-computing-conversion-masters-courses/

a. Female students

b. Black students

c. Students registered disabled

d. Students from POLAR Q1 and Q2

e. Care experienced students

f. Estranged students

g. Gypsy, Roma, Traveller students

h. Refugees

i. Children from military families, veterans and partners of military personnel

We are particularly interested in female, black and registered disabled students, and expect bids to demonstrate in their outreach and marketing campaign how they will specially focus on those three groups.

20. There is no maximum limit on requests for scholarship funding, but requests must be supported by a credible proposal. Scholarship eligible students must account for at least 20 per cent of total anticipated student numbers for proposed courses. Within the bid, providers must specify how they will prioritise scholarships for female, black and disabled students should they find their programmes oversubscribed.

21. We expect the funding requested to reflect the size of the target student group and the relative scale of improvements the activities aim to achieve. We also expect the requested funding to reflect the scale of innovation within the bid.

22. We particularly want to receive bids from partnerships of different types of providers and strategic partners that can work together to develop and deliver the conversion courses set out in this competition.

23. We shall be seeking a range of new courses that will suit the needs of a diverse workforce. We will be looking for a spectrum of provision that might include innovative full-time courses and courses that enable flexible, blended learning and part-time learning that co-exist alongside existing employment or caring responsibilities, for example.

24. We expect every bid to include:

    a. Outreach and marketing campaigns designed to attract harder to reach groups and based on effective practice wherever possible. This should focus specifically on female, black students and those registered disabled;

    b. Paid work placements that are inclusive and aligned to the objectives of the programme; and

    c. Holistic pastoral support packages that will support students to succeed.

25. We will expect curriculum design and content development to make use of employer partners to create industry relevant and integrated curriculum, including opportunities for industry partners to participate in course delivery where appropriate.

26. Bidders should demonstrate how their proposal aligns with their institutional strategies for learning and teaching, equality and diversity and, where appropriate, their 2020-21 to 2024-25 access and participation plan.

Bid requirements and assessment criteria

27. The primary purpose of this funding is to increase the number of skilled people in AI and data science by at least 2,500 by autumn 2023.

28. Proposals must be underpinned by a strategic approach and firm evidence base. They must be informed by and integrated with the needs of relevant employers.

29. Bids must include:

    a. Explicit support from students, employers, and relevant organisations as well as from the higher education provider itself;

    b. Ambitious goals to increase the number of skilled people in AI or data science by 2023;

    c. Evidence of the funding and resources that all partners and stakeholders will commit towards the project.

30. Bids must be supported by a robust evaluation and monitoring plan. As a minimum, this activity should represent 5 per cent of the total project cost.

31. Bids for this competition will be assessed against the following criteria:

    a. The extent to which new conversion course starts will be achieved between September 2020 and March 2023;

    b. The extent to which the proposal identifies and addresses evidenced employer needs through its programme. This will include consideration of the extent to which employers have been consulted on the proposed developments and are involved in either those developments or the implementation of the programme;

    c. The extent to which the proposal considers and addresses specific student needs. This will include consideration of the extent to which students and graduates are directly involved in the development of key activities, where appropriate;

    d. The extent to which proposals demonstrate consideration of steps to market, including: recruiting learners; satisfying internal institutional requirements; and recruiting key staff within project timelines;

    e. The extent to which the proposal is ambitious in its plans to recruit underrepresented students and support them through credible means of allocating scholarships, including details of the allocation process;

f. The extent to which the proposal demonstrates a rigorous approach to the design of the project, the evaluation of its success and ongoing monitoring;

g. The extent to which proposals are supported by external investment and funding from partners, particularly employers. We expect to see a proportionate funding contribution from all the partners involved in the proposal. This will help to evidence demand and share risk, as well as value for money;

h. The ambition and likelihood that the activities will secure a significant change in current practice and continue to sustain improved outcomes for AI and data science graduates over the medium to long term.

32. We will accept no more than one individual bid per higher education provider. Through collaboration, providers may be involved in additional bids, with each collaborative bid requiring an eligible lead provider for funding purposes. Providers may not act as the lead on more than one bid.

33. Funding will be awarded to the successful bidders on the following basis:

    a. Development funding:

        i. A maximum level of £100,000 for individual providers and £200,000 for collaborative bids involving different types of higher education providers. We will consider collaborative bids that exceed this limit if they aim to deliver at least half of the overall target number (i.e. 1,250 students). We will look more favourably on bids which involve a collaboration of higher education providers and other strategic partners working together to accelerate delivery of conversion courses.

        ii. The funding available is revenue only and must not be used for capital expenditure.

        iii. The funding is expected to contribute to the cost of curriculum development, internal validation, advertising and promotion of the courses, including outreach and recruitment activity. It must not be used for work placement or internship salaries.

        iv. The funding cannot contribute to more than 50 per cent of any evaluation or monitoring activity.

        v. Funding must be spent by March 2023.

        vi. We expect any provider that is involved in the Institute of Coding (IoC) to explain clearly how the activity proposed as part of this competition complements and does not duplicate IoC activity.

    b. Scholarship funding:

        i. The funding available is for underrepresented student groups as set out in paragraph 19. At least 20 per cent of the bid's overall total numbers should be from one of the groups listed there, with clear priority given to the top three groups (female, black, and disabled students).

ii. Bidders will need to make clear the student groups targeted as part of their project activity, as well as how they will manage scholarship allocation in instances of over-subscription.

iii. Bidders will need to provide estimates for scholarship allocation across the three years of this programme, based on anticipated student numbers. We expect the funding to be paid in intervals to the student throughout the duration of the course. We expect successful bidders to align scholarship payments with other financial support payments (e.g. Masters' loans, other financial assistance).

iv. Successful bidders will be expected to work closely with the OfS following the panel and during scholarship allocation, in order to ensure we are able to consider how best to meet bidder requests with our total available funding, and how to align emergent demand for scholarships across the portfolio during the life of the programme. .

c. Funding will be provided during the period from April 2020 to March 2023. Projects must begin delivery in autumn 2020.

d. By March 2023, we expect all projects to have completed course development and recruitment activities related to this funding initiative, though there will be certain activities that go beyond that date. We expect that support for students enrolled in academic year 2022-23 should continue throughout the duration of their studies, and that scholarship payments for certain students may continue beyond March 2023, subject to the discretion of OfS.

e. As part of our risk sharing and to provide evidence of clear commitment from the provider and partners, we expect to see funding contributions alongside requests for OfS funding.

f. This funding is intended to support new activity. We do not expect to fund activities already underway, or those which would take place irrespective of this competition. If proposals build on already planned activity or overlap with existing activities (e.g. access and participation plan commitments), they should make clear how the requested funding will provide genuine additionality and avoid duplication.

g. We anticipate supporting a wide range of projects, to deliver a diverse set of evidence-based bids.

Bidding process and timescales

34. Eligible providers are invited to submit bids for funding using the template at Annex A[12]. Proposals must be emailed to PGconversion@officeforstudents.org.uk by **1700 on Friday 10 January 2020**. Late submissions will not be accepted. Bids not using the template, or altering it, will be deemed invalid and will not be assessed. Bids should not exceed the maximum length specified in Annex A.

[12] Available at: www.officeforstudents.org.uk/publications/ai-and-data-science-pg-conversion-course-funding/

35. Following submission, bids will be assessed internally and considered by a panel of external experts. As part of their assessment, the expert panel will consider the extent to which the funded activity will form a balanced portfolio of activities and scholarship distribution

36. Final decisions will be made by the OfS's chief executive or board, depending on considerations of cost and risk.

37. The timetable for this competition is as follows:

Date	Activity
1700 on 10 January 2020	Deadline for bids
January 2020	Assessment process
February 2020	Panel meeting to review and recommend bids for funding
March 2020	Decisions communicated to bidders and public announcements made
April 2020	Funding commences

Monitoring requirements

38. Funded projects will be subject to individual monitoring arrangements depending on the level of funding awarded and risk assessment. Providers will be expected to report on scholarship numbers throughout the life of the project.

39. We will issue grant award letters to all funded projects setting out the terms and conditions of the funding, which must be formally agreed before grant payments will commence. We will take a risk-based, proportionate approach to monitoring, to ensure value for money and the delivery of targets, objectives, outputs and outcomes. We will undertake visits to and meetings with projects to better understand the activities, impacts and outcomes and to support analysis and dissemination.

40. We expect each project to evaluate its own activity and share the findings. One of the purposes of this funding is to add to the knowledge base on conversion courses, flexible provision, and outreach for mature students. Individual project evaluations will be essential to assessing what works and to determining the value for money of this investment. While we are not setting out specific requirements for the scope of project evaluations, we would expect projects to spend no less than 5 per cent of their total project costs on evaluation. To demonstrate appropriate investment, we would not expect that OfS funding should contribute more than 50 per cent towards evaluation costs.

41. We will also commission an independent evaluation of the overall scheme and will notify the funded projects of this work accordingly. We expect all funded projects to work with the OfS and the evaluators in an open and transparent way, to share learning and best practice for the benefit of students and the wider higher education sector, and to provide detailed analysis of successful and unsuccessful activities in order to understand lessons learnt. To support this, we will hold workshops and other engagements to facilitate the forming of a project network, with which all funded projects must engage.

42. Funded projects should continue their monitoring and evaluation activities until all students supported through this initiative have completed their courses and will need to be able to measure the graduate outcomes for those involved beyond the funded programme. We expect projects to inform the OfS during the life of the programme about its plans to monitor those specific outcomes, and to engage with our evaluator to ensure a consistent approach to monitoring is applied across all funded projects.

Next steps

43. We invite interested and eligible higher education providers to complete the bid template at Annex A[13] and email it to PGconversion@officeforstudents.org.uk **by 1700 on Friday 10 January 2020**.

44. We have published FAQs and additional resources on our website[14] to help providers develop their bid and implement their project. We encourage providers to review this page frequently.

[13] Available at: www.officeforstudents.org.uk/publications/ai-and-data-science-pg-conversion-course-funding/
[14] See www.officeforstudents.org.uk/advice-and-guidance/skills-and-employment/postgraduate-conversion-courses-in-data-science-and-artificial-intelligence/FAQs/